

REMARKS

Claims 1-14 are all the claims pending in the application. Claims 10-14¹ have been withdrawn from consideration as being drawn to a non-elected invention. Claims 1-9 stand rejected. Claims 10 and 11 are objected to.

Applicants have made a provisional election of Group I, claims 1-11, drawn to a spark plug. Claims 12-14 have been withdrawn from further consideration. Affirmation of the election is hereby made.

A Preliminary Amendment was filed on September 4, 2002, in which claims 12 and 13 were amended to depend from claim 1, and the Examiner was requested to Examiner these claims along with claims 1-11. The Examiner has not responded to this request.

The Examiner has not returned the initialed Form PTO-1449 for the Information Disclosure Statements filed on August 25, 2000, November 8, 2000 and January 22, 2001. Applicants respectfully request that the initialed forms be returned with the next Office Action.

Also, Applicants respectfully request the Examiner to acknowledge receipt or indicate approval of the Formal Drawings filed on November 8, 2000.

Claims 10 and 11 are objected to because they are in improper form since a multiple dependent claim cannot depend on another multiple dependent claim. Applicants amend the claims accordingly and request a proper examination of the merits.

Claims 1-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kanao (5,557,158) in view of Fukuoka (6,294,262).

¹ This should read: claims 12-14.

Analysis

Claim 1 is the only claim in independent form; therefore, the following discussion is initially directed to this independent claim.

The present invention is directed to a spark plug in which the surface of a main metal shell, which is provided outside an insulator, is coated with a complex chromate coat.

The main metal shell of the present invention needs corrosion resistance at room temperature. In addition, the main metal shell needs corrosion resistance under heated conditions, i.e., when it is used in an internal combustion engine. A temperature of the main metal shell of the present invention is about 200 °C to 250 °C, when it is attached to the internal combustion engine.

Thus, in the present invention, a complex chromate coat of the main metal shell according to claim 1 has the corrosion resistance under a condition that the main metal shell is heated at 200°C to 250°C. For instance, please see the specification at page 29, lines 3 to 8, and Fig. 10, which describe these heating conditions.

Kanao is directed to improving the tip portion of the center electrode. There is no disclosure related to a coating on the surface of a metal housing.

Fukuoka is directed to an anticorrosive treatment for the surface of a non-ferrous metal.

Fukuoka appears to disclose that a chromate coat can be used as a main metal shell for a spark plug under a condition that it is heated. However, in Fukuoka, a chromate coat is used under a condition that it is heated by a heat exchanger, and is used under a condition of less than 100°C.

Thus, one of ordinary skill in the art would not have been motivated to use the coating disclosed in Fukuoka since there is no teaching or suggestion that it could withstand the heating conditions undergone by the sparkplug of Kanao.

In view of the foregoing, Applicants respectfully request the Examiner to reconsider and withdraw the rejection of claim 1.

The remaining rejections are directed to the dependent claims. These claims are patentable for at least the same reasons as claim 1, by virtue of their dependency therefrom. Moreover, these claims are patentable due to their own recitations contained therein.

For example, the lower range of the phosphorous and silicon components is not disclosed in Fukuoka. That is, the lower range of both components is 10 parts by weight in Fukuoka; however, **claim 4** currently includes a lower range (5-10) for the phosphorous.

Also, turning to dependent **claim 9**, Kanao does not disclose an annular gasket fitted around a basal end portion of a threaded section on a peripheral surface of the meal housing 207. Moreover, there is no suggestion for providing such a gasket, or for coating such a gasket with a complex chromate coat. Fukuoka is not directed to the structure of a spark plug, and thus, fails to overcome the deficiencies of Kanao. Thus, claim 9 also provides additional patentable subject matter.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Amendment under 37 C.F.R. § 1.111
U.S. Appln. No. 09/645,599

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Ellen R. Smith
Registration No. 43,042

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE



23373

PATENT TRADEMARK OFFICE

Date: May 27, 2003

Attorney Docket No.: Q60610